FluWatch

Public Health Agency of Canada | Agence de la santé publique du Canada

December 29, 2013 to 4 January, 2014 (Week 01)

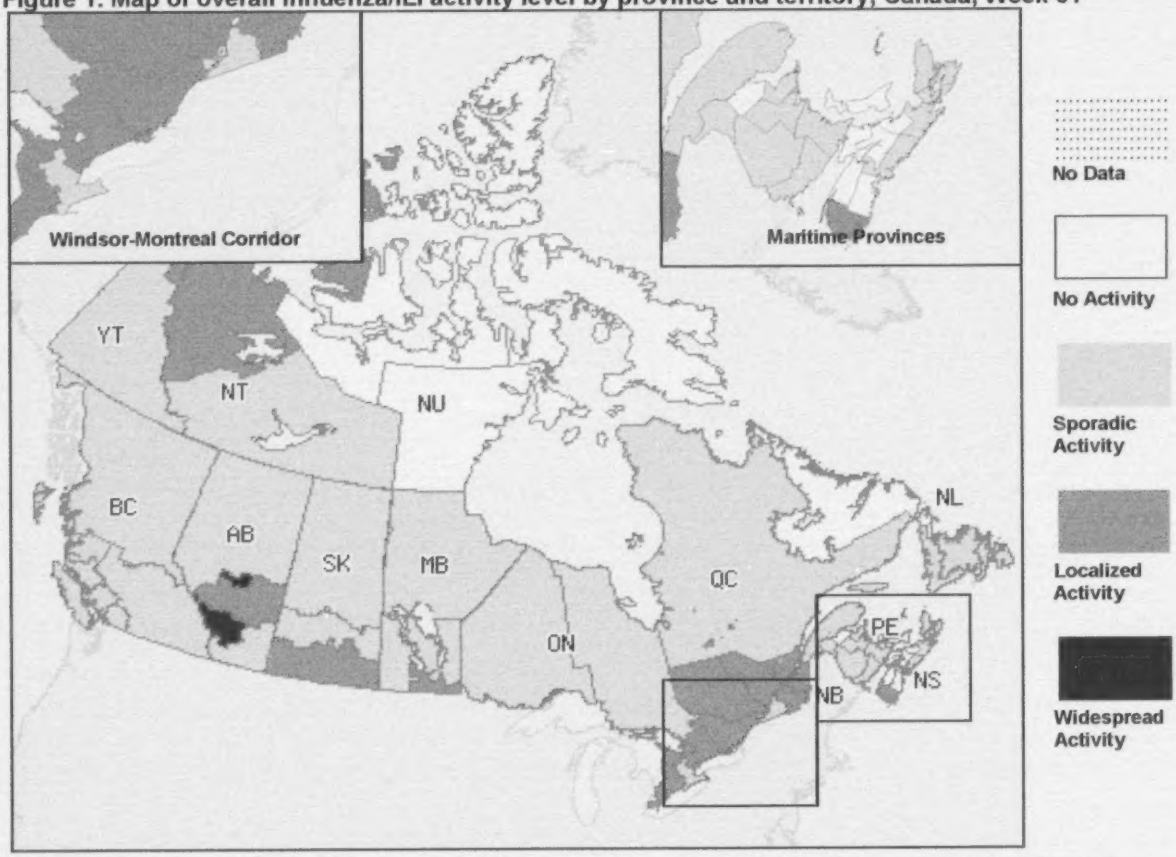
Overall Summary

- Influenza activity in Canada continued to increase in week 01 with increases in laboratory detections of influenza, ILI consultations, hospitalizations with influenza and prescriptions for influenza antivirals. A(H1N1)pdm09 remains the predominant virus subtype this season.
- A greater proportion of cases have been reported among adults 20-64 years of age compared to those ≥65 years of age, which is a change from the demographics of the 2012-13 season when A(H3N2) was predominant.
- A fatal case of A(H5N1) was reported in Alberta on 8 January 2014 in a patient with a travel history to China. Close contacts have shown no signs of infection and continue to be monitored. The risk to Canadians of transmission of A(H5N1) from this case is very low.

Influenza/ILI Activity (geographic spread)

In week 01, two regions in Alberta continued to report widespread activity, and 12 regions (in AB(1), SK(1), MB(1) ON(4), QC(3), NS(1) and NT(1)) reported localized activity (Figure 1).

Figure 1. Map of overall influenza/ILI activity level by province and territory, Canada, Week 01

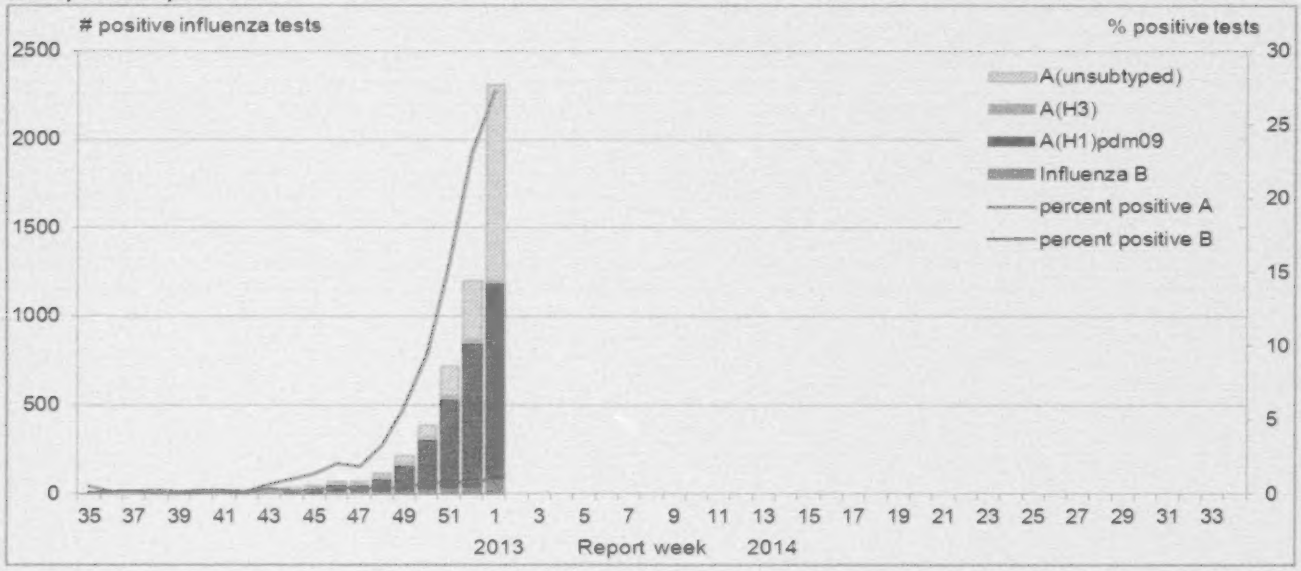


Note: Influenza/ILI activity levels, as represented on this map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, sentinel ILI rates and reported outbreaks. Please refer to detailed definitions at the end of the report. Maps from previous weeks, including any retrospective updates, are available on the FluWatch website.

Influenza and Other Respiratory Virus Detections

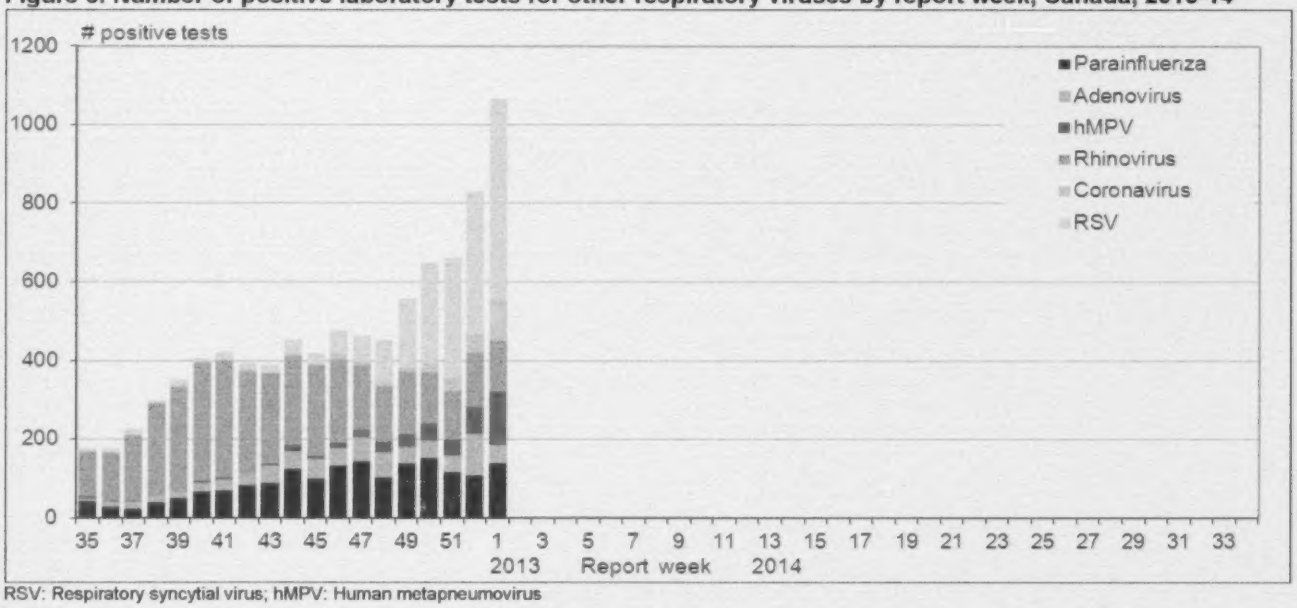
The number of positive influenza tests continued to increase, from 1,201 in week 52 to 2,308 in week 01, bringing the percentage of positive influenza tests to 28.4% (Figure 2). Cumulative influenza virus detections to date have been predominantly influenza A (95%). Among subtyped influenza A viruses, 96% (3,035/3,164) were A(H1N1)pdm09 (Table 1). Detailed information on age and type/subtype has been received for 3,842 cases to date this season. A significantly greater proportion of laboratory detections of influenza have been reported in adults 20-64 years of age compared to those ≥65 years of age this season compared to the 2012-13 season (Table 2). This is expected given the predominance of A(H1N1)pdm09 this season compared to 2012-13 when A(H3N2) was the dominant circulating subtype.

Figure 2. Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, 2013-14



In week 01, the number of positive tests for RSV continued to increase, and RSV remained the second most frequently detected virus, after influenza. The number of positive tests for coronavirus and human metapneumovirus increased, while detections of rhinovirus and parainfluenza were stable in week 01, compared to week 52 (Figure 3).
For more details, see the weekly Respiratory Virus Detections in Canada Report.

Figure 3. Number of positive laboratory tests for other respiratory viruses by report week, Canada, 2013-14



RSV: Respiratory syncytial virus; hMPV: Human metapneumovirus

Table 1. Weekly and cumulative numbers of positive influenza specimens by type, subtype and province, Canada, 2013-14

Reporting provinces[1]	Weekly (December 29, 2013 to January 4, 2014)					Cumulative (August 25, 2013 to January 4, 2014)				
	Influenza A				B	Influenza A				B
	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total
BC	207	85	0	122	4	415	274	12	129	15
AB	630	502	2	126	0	1503	1348	14	141	21
SK	198	138	0	60	0	365	230	0	135	0
MB	29	16	0	13	0	57	37	0	20	6
ON	676	300	17	359	10	1702	1033	100	569	37
QC	426	58	0	368	65	793	91	1	701	167
NB	29	4	0	25	0	41	5	1	35	0
NS	9	0	0	9	0	17	2	1	14	0
PE	0	0	0	0	0	1	1	0	0	0
NL	23	0	0	23	2	38	14	0	24	6
Canada	**2227**	**1103**	**19**	**1105**	**81**	**4932**	**3035**	**129**	**1768**	**252**
Percentage[2]	96.5%	49.5%	0.9%	49.6%	3.5%	95.1%	61.5%	2.6%	35.8%	4.9%

Table 2. Weekly and cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting[3], Canada, 2013-14

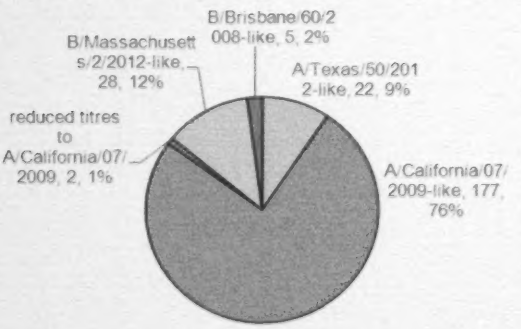
Age groups (years)	Weekly (December 29, 2013 to January 4, 2014)					Cumulative (August 25, 2013 to January 4, 2014)						
	Influenza A				B	Influenza A				B	Influenza A and B	
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	#	%
<5	120	49	0	71	3	625	356	15	254	42	667	17.2%
5-19	25	11	0	14	4	281	195	6	80	43	324	8.4%
20-44	240	102	0	138	11	1161	716	11	434	51	1212	31.3%
45-64	206	70	0	136	21	968	558	16	394	77	1045	27.0%
65+	119	37	1	81	22	480	221	24	235	114	594	15.4%
Unknown	1	0	0	1	0	26	16	4	6	0	26	0.7%
Total	711	269	1	441	61	3541	2062	76	1403	327	3868	100.0%
Percentage[2]	92.1%	37.8%	0.1%	62.0%	7.9%	91.5%	58.2%	2.1%	39.6%	8.5%		

[1] Specimens from NT, YT, and NU are sent to reference laboratories in other provinces. Cumulative data includes updates to previous weeks.
[2] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
[3] Table 2 includes specimens for which demographic information was reported. These represent a subset of all positive influenza cases reported.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Influenza Strain Characterizations

During the 2013-2014 influenza season, the National Microbiology Laboratory (NML) has antigenically characterized 234 influenza viruses [22 A(H3N2), 179 A(H1N1)pdm09 and 33 influenza B]. The vast majority (97.9%) of viruses were similar to the strains recommended by the WHO for the 2013-14 seasonal influenza vaccine. Two A(H1N1)pdm09 viruses showed reduced titres to antiserum against the reference A/California/07/2009 strain. Five influenza B viruses were similar to the strain recommended by the WHO for the 2011-12 vaccine (Figure 4).

Figure 4. Influenza strain characterizations, Canada, 2013-14, N = 234



The NML receives a proportion of the number of influenza positive specimens from provincial laboratories for strain characterization and antiviral resistance testing. Characterization data reflect the results of haemagglutination inhibition (HAI) testing compared to the reference influenza strains recommended by WHO.

The recommended components for the 2013-2014 northern hemisphere trivalent influenza vaccine include: an A/California/7/2009(H1N1)pdm09-like virus, an A(H3N2) virus antigenically like the cell-propagated prototype virus A/Victoria/361/2011b (e.g. A/Texas/50/2012), and a B/Massachusetts/2/2012-like virus (Yamagata lineage).

Antiviral Resistance

During the 2013-2014 influenza season, NML has tested 197 influenza viruses for resistance to oseltamivir and for resistance to zanamivir, and all were sensitive. All 166 influenza A viruses tested for amantadine resistance were resistant (Table 3).

Table 3. Antiviral resistance by influenza virus type and subtype, Canada, 2013-14

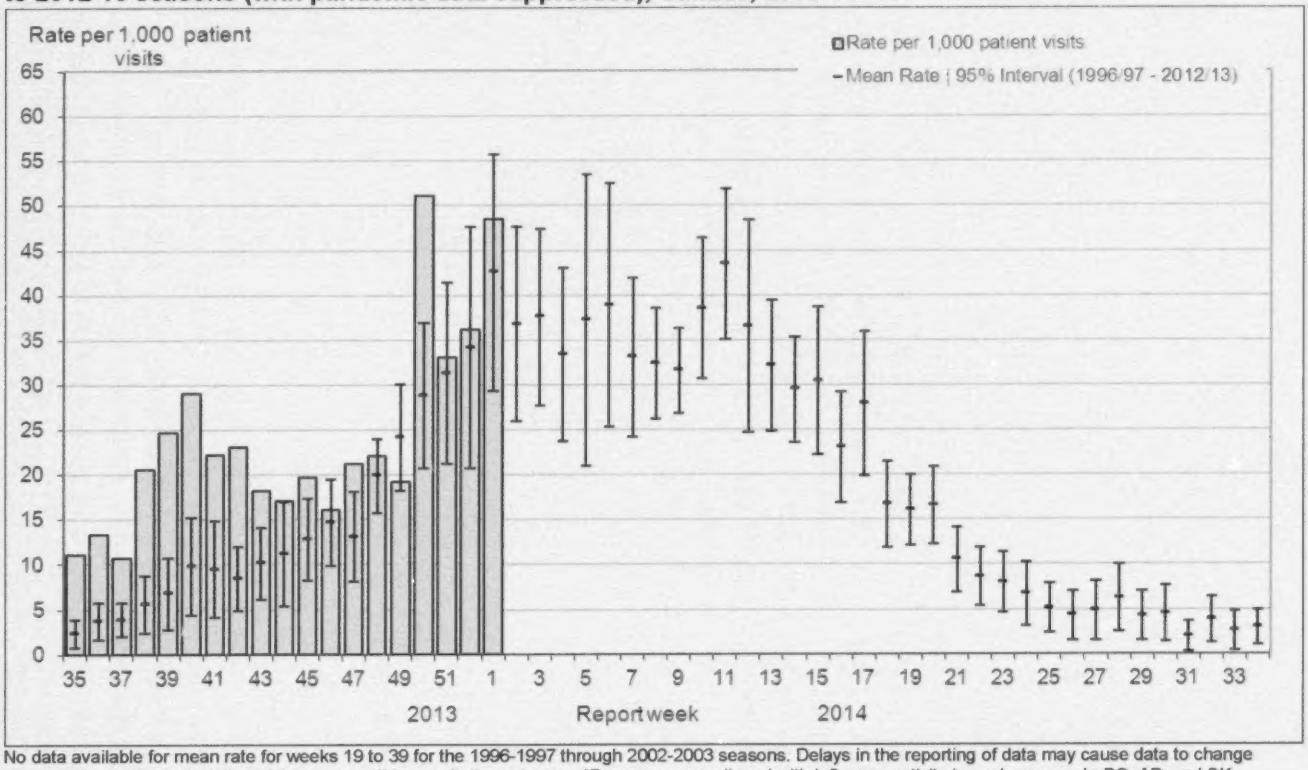
Virus type and subtype	Oseltamivir		Zanamivir		Amantadine	
	# tested	# resistant (%)	# tested	# resistant (%)	# tested	# resistant (%)
A (H3N2)	23	0	23	0	29	29 (100%)
A (H1N1)	143	0	143	0	137	137 (100%)
B	31	0	31	0	NA[1]	NA[1]
TOTAL	197	0	197	0	166	166 (100%)

[1] NA – not applicable

Influenza-like Illness Consultation Rate

The national influenza-like-illness (ILI) consultation rate increased from 36.2/1,000 in week 52 to 48.5/1,000 in week 01, but is still within the expected range for this time of year (Figure 5).

Figure 5. Influenza-like-illness (ILI) consultation rates by report week, compared to the 1996-97 through to 2012-13 seasons (with pandemic data suppressed), Canada, 2013-14

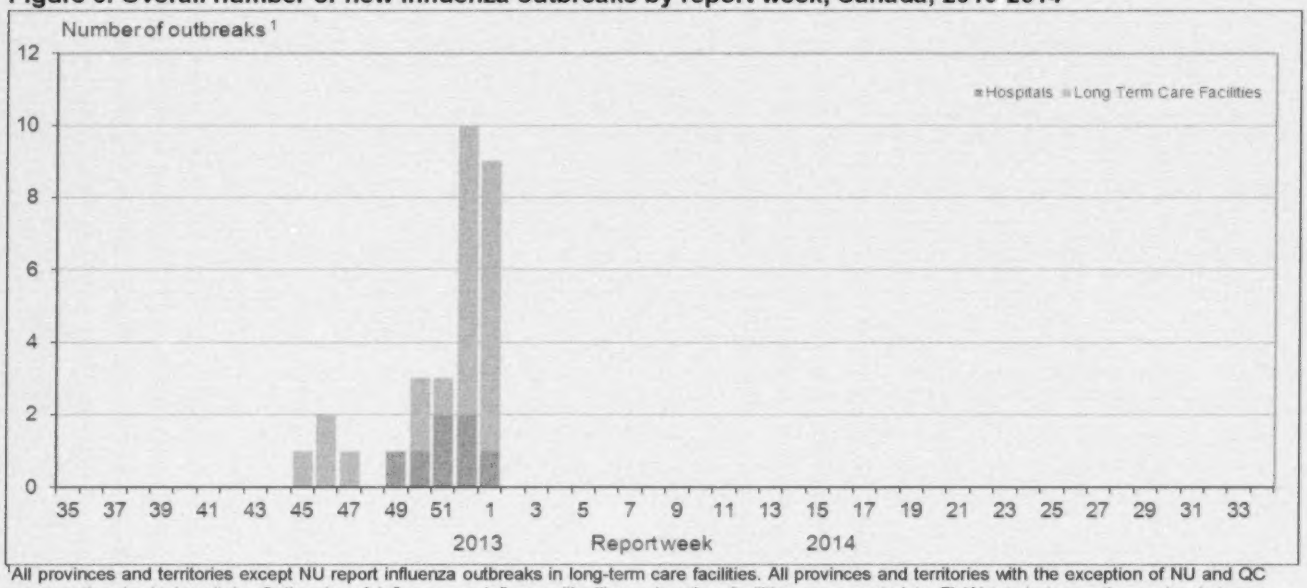


No data available for mean rate for weeks 19 to 39 for the 1996-1997 through 2002-2003 seasons. Delays in the reporting of data may cause data to change retrospectively. The calculation of the average ILI consultation rate over 17 seasons was aligned with influenza activity in each season. In BC, AB, and SK, data is compiled by a provincial sentinel surveillance program for reporting to FluWatch. The number of sentinel physicians in each province or territory is as follows: BC(21), AB(80), SK(11), MB(18), ON(169), QC(14), NB(29), NS(26), PE(4), NL(16), NU(1), NT(14), YT(13). Not all sentinel physicians report every week.

Influenza Outbreak Surveillance

In week 01, nine new influenza outbreaks were reported: eight in long-term care facilities and one in a hospital (Figure 6).

Figure 6. Overall number of new influenza outbreaks by report week, Canada, 2013-2014

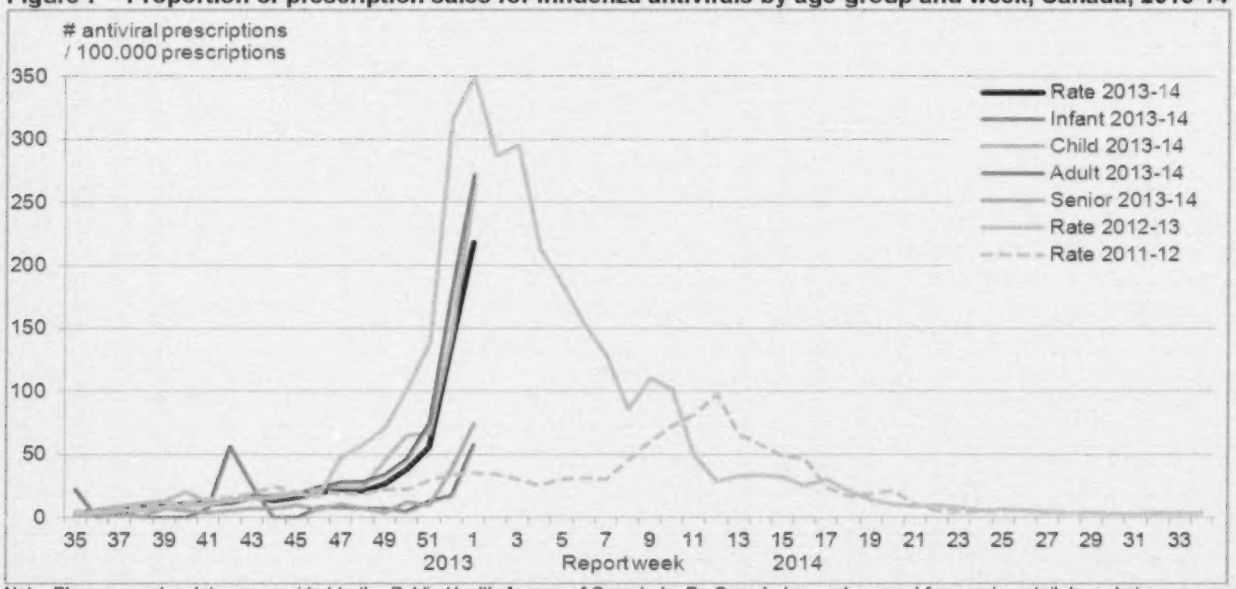


[1]All provinces and territories except NU report influenza outbreaks in long-term care facilities. All provinces and territories with the exception of NU and QC report outbreaks in hospitals. Outbreaks of influenza or influenza-like-illness in other facilities are reported to FluWatch but reporting varies between jurisdictions. Outbreak definitions are included at the end of the report.

Pharmacy Surveillance

The rate of prescriptions for influenza antivirals followed a trend consistent with laboratory detections of influenza this season, compared with the two previous seasons. The largest proportions of prescriptions for antivirals are among adults 19-64 years of age and children 2-18 years of age. This is in keeping with the age-distribution observed among laboratory detections and hospitalizations during the season to date (Figure 7).

Figure 7 – Proportion of prescription sales for influenza antivirals by age-group and week, Canada, 2013-14



Note: Pharmacy sales data are provided to the Public Health Agency of Canada by Rx Canada Inc. and sourced from major retail drug chains representing over 3,000 stores nationwide (excluding Nunavut) in 85% of Health Regions. Data provided include the number of new antiviral prescriptions (for Tamiflu and Relenza) and the total number of new prescriptions dispensed by Province/Territory and age group. Age-groups: Infant: 0-2y, Child: 2-18y; Adult: 19-64y, Senior: ≥65y

Sentinel Hospital Influenza Surveillance

Paediatric Influenza Hospitalizations and Deaths (IMPACT)

In week 01, 40 new laboratory-confirmed influenza-associated paediatric (≤16 years of age) hospitalizations were reported by the Immunization Monitoring Program Active (IMPACT) network, compared to 53 in week 52. All 40 hospitalizations in week 01 were cases with influenza A; 30% of these were A(H1N1)pdm09 and the remainder were A(unsubtyped) (Figure 8a). All but three of the cases were <5 years of age: of these, 13 (32.5%) were under 6 months of age, 9 (22.5%) 6-23 months of age, and 15 (37.5%) 2-4 years of age. Six ICU admissions were reported in week 01, two children 6-23 months of age, one 2-4 years of age, and three 5-9 years of age; all with influenza A. No deaths were reported.

To date this season, a total of 183 influenza-associated paediatric hospitalizations have been reported by the IMPACT network, 93% of which have been influenza A, and the majority of those subtyped were A(H1N1)pdm09 (Table 4). Eighty-five (46.4%) cases have been children under 2 years of age, and 143 (78.1%) have been under 5 years of age. Twenty-four ICU admissions have been reported; all but two cases with influenza A, and the majority A(H1N1)pdm09. The age-distribution is as follows: two children under 6 months of age, nine children 6-23 months of age, six 2-4 years of age, two 5-9 years of age, and five 10-16 years of age (Figure 9a). Among the 22 ICU cases with available data, 16 were reported to have comorbidities or concurrent infection. No deaths have been reported.

Note: The number of hospitalizations reported through IMPACT represents a subset of all influenza-associated paediatric hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Adult Influenza Hospitalizations and Deaths (PCIRN)

The number of new laboratory-confirmed influenza-associated adult (≥16 years of age) hospitalizations reported through active* surveillance by the PHAC/CIHR Influenza Research Network (PCIRN) Serious Outcomes Surveillance (SOS) network increased from 63 in week 52 to 89 in week 01. Among cases in week 01, 86 (96.6%) were influenza A, of which 19 (22.1%) were A(H1N1)pdm09 and 67 (77.9%) were A(unsubtyped). The highest proportion of hospitalizations occurred among adults ≥65 years of age (36; 40.4%), followed by adults aged 45-64 years (31; 34.8%). Nineteen ICU admissions were reported in week 01: five (26.3%) cases 20-44 years of age, and eight (36.8%) cases in each of the age-groups 45-64 years and ≥65 years of age. One death was reported, in an adult ≥65 years of age with influenza A(unsubtyped) (Figure 8b).

To date this season, 270 influenza-associated hospitalizations have been reported by the PCIRN-SOS network, 261 (96.7%) with influenza A, predominantly A(H1N1)pdm09. The majority (71%) have been adults over 45 years of age (Table 5). ICU admission was required for 48 hospitalizations: 47 of which were cases of influenza A (25 A(H1N1)pdm09 and 22 A(unsubtyped)); 34 (70.8%) of the ICU admissions were >45 years of age. Of the 18 cases with information on influenza vaccination, 14 reported not having been vaccinated this season. One death has been reported, a case ≥65 years of age with A(unsubtyped) (Figure 9b).

Note: PCIRN-SOS conducted passive surveillance from April 30th to November 14th, 2013. Cases reported during this period were identified by laboratory detection of influenza among patients admitted to participating hospitals. Active surveillance began November 15th during which time PCIRN site coordinators investigate cases potentially related to influenza. Data from both active and passive surveillance reported during the 2013-14 season are included in this report. The number of hospitalizations reported through PCIRN represents a subset of all influenza-associated adult hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Table 4 – Cumulative numbers of paediatric hospitalizations with influenza reported by the IMPACT network, Canada, 2013-14

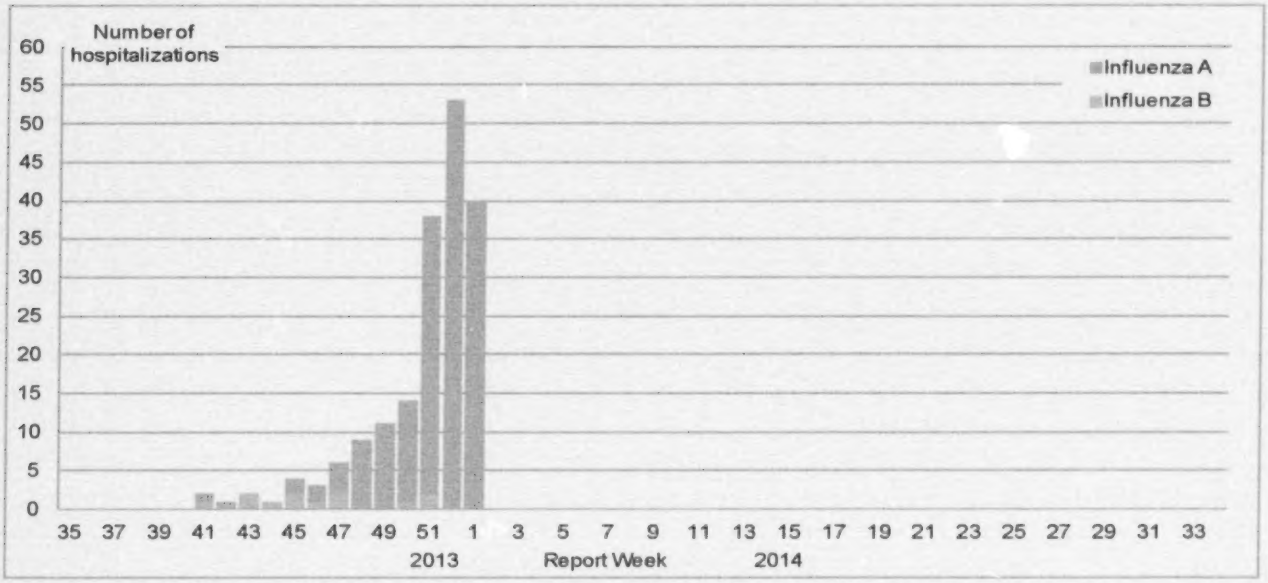
Age groups	Cumulative (25 Aug. 2013 to 4 Jan. 2014)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
0-5m	37	10	0	27	1	38 (21%)
6-23m	46	23	0	23	1	47 (26%)
2-4y	53	20	1	32	5	58 (32%)
5-9y	22	10	0	12	3	25 (14%)
10-16y	13	7	0	6	2	15 (8%)
Total	171	70	1	100	12	183
% [1]	93.4%	40.9%	0.6%	58.5%	6.6%	100.0%

Table 5 – Cumulative numbers of adult hospitalizations with influenza reported by the PCIRN-SOS network, Canada, 2013-14

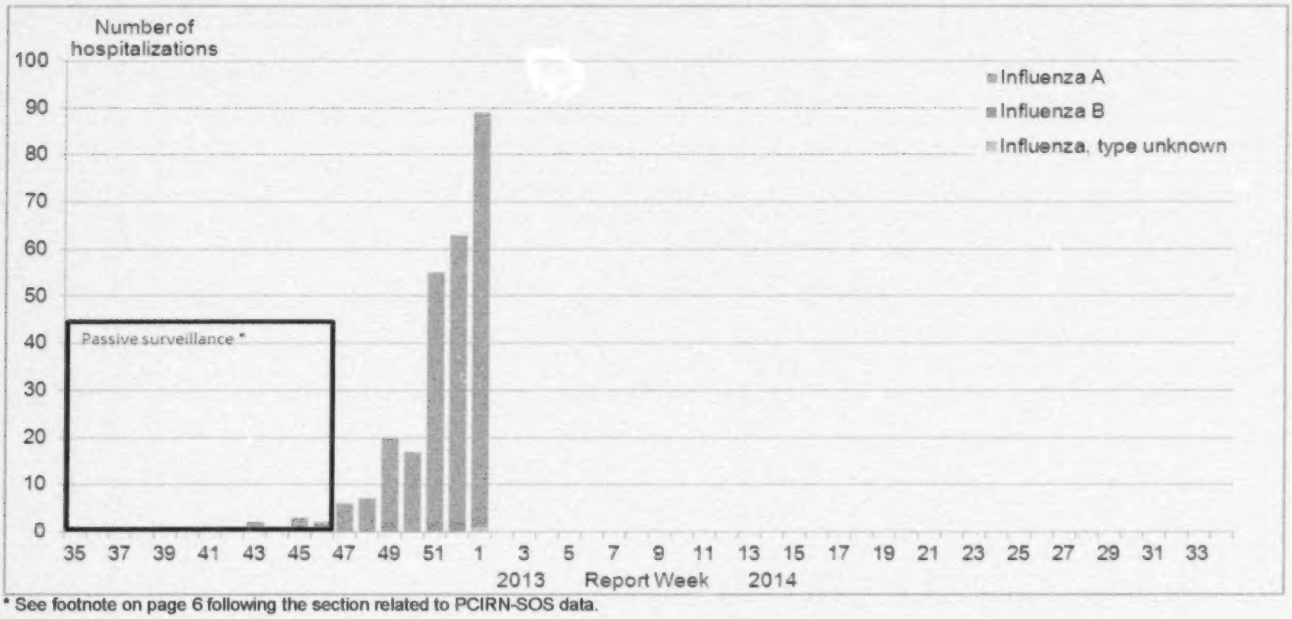
Age groups (years)	Cumulative (25 Aug. 2013 to 4 Jan. 2014) *					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A(UnS)	Total	# (%)
16-20	5	2	0	3	0	5 (2%)
20-44	73	23	1	49	0	73 (27%)
45-64	100	32	1	67	4	104 (39%)
65+	83	34	4	45	4	87 (32%)
Total	261	91	6	164	8	269
% [1]	97%	35%	2%	63%	3%	100%

[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections. UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available. * One case for which the influenza type has not yet been reported is not included in Table 5.

Figure 8 – Number of cases of influenza reported by sentinel hospital networks, by week, Canada, 2013-14
A) Paediatric hospitalizations (≤16 years of age, IMPACT)



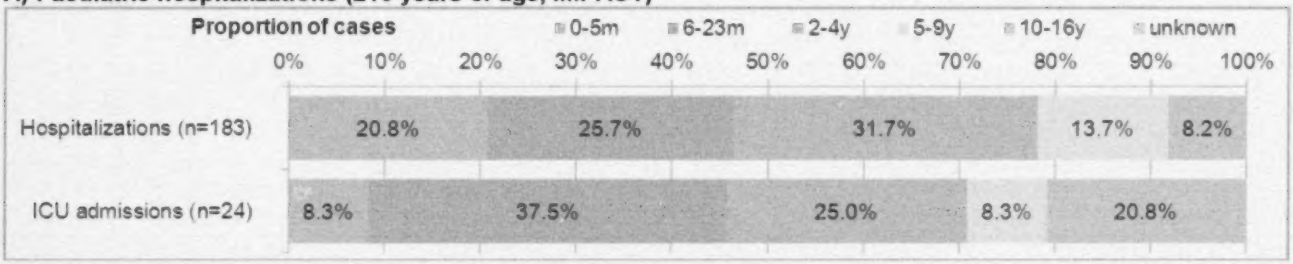
B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



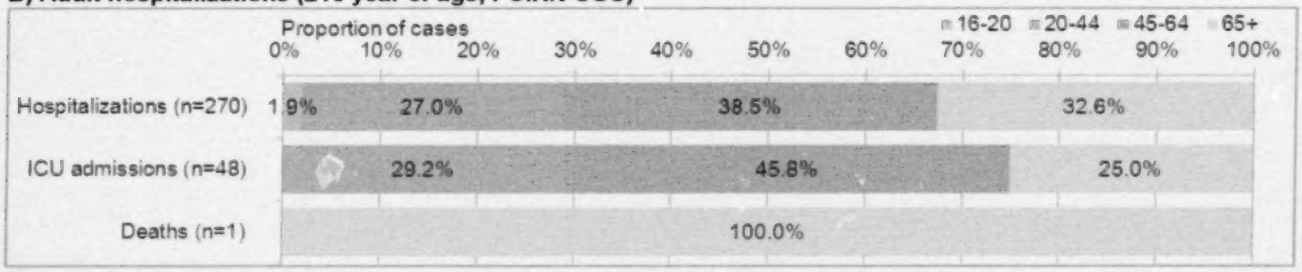
* See footnote on page 6 following the section related to PCIRN-SOS data.

Figure 9 – Percentage of hospitalizations, ICU admissions and deaths with influenza reported by age-group, Canada, 2013-14

A) Paediatric hospitalizations (≤16 years of age, IMPACT)



B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



Provincial/Territorial Influenza Hospitalizations and Deaths

In week 01, 236 new laboratory-confirmed influenza-associated hospitalizations were reported from participating provinces and territories.* The majority were cases of influenza A (97%), of which 102 (44.5%) were A(H1N1)pdm09, five were A(H3N2), and 122 were A(unsubtyped). There were 13 ICU admissions in week 01, all with influenza A. More than three quarters of the ICU admissions were among adults 20-64 years of age. Twelve deaths were reported in adults 20 years of age and older, all with influenza A. The number of new influenza-associated hospitalizations and deaths reported for the current week may include cases from Ontario that occurred in previous weeks, as a result of retrospective updates to the cumulative total.

To date this season, 882 influenza-associated hospitalizations have been reported, of which 97.2% had influenza A (Table 6). The largest proportion of hospitalizations has been among cases 45-64 years of age (33%). To date, a significantly greater proportion of adult cases (≥20 years of age) have been 20-64 years of age this season compared to the 2012-13 season which is consistent with the predominant circulation of A(H1N1)pdm09 this season. One hundred and eighteen ICU admissions have been reported this season, all cases of influenza A; and 77% were among adults aged 20-64 years. Thirty-three deaths have been reported, and all but one were cases of influenza A. The highest proportion of deaths has been among adults 20-64 years of age (64%), followed by adults ≥65 years of age (27%). It is important to note that the hospitalization or death does not have to be attributable to influenza, a positive laboratory test is sufficient for reporting. Detailed clinical information (e.g. underlying medical conditions) is not known for these cases.

* Note: Influenza-associated hospitalizations are not reported to PHAC by the following Provinces and Territory: BC, NU, QC, NS, and NB. Only hospitalizations that require intensive medical care are reported by Saskatchewan. ICU admissions are not distinguished among hospital admissions reported from Ontario. Data may also include cases reported by the IMPACT and PCIRN networks.

Table 6 – Cumulative number of hospitalizations with influenza reported by the participating provinces and territories, Canada, 2013-14

Age groups (years)	Cumulative (25 Aug. 2013 to 4 Jan. 2014) *					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
0-4	167	94	4	69	12	179 (20%)
5-14	45	25	1	19	3	48 (5%)
15-19	13	7	0	6	0	13 (1%)
20-44	165	104	1	60	0	165 (19%)
45-64	289	177	9	103	1	290 (33%)
65+	176	110	12	54	9	185 (21%)
Total	855	517	27	311	25	880
Percentage[1]	97.2%	60.5%	3.2%	36.4%	2.8%	100%

[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.
* Two cases for which age information is not available have not been included in Table 6.

Emerging Respiratory Pathogens

Human Avian Influenza

Influenza A(H7N9): Seven new cases of human infection with influenza A(H7N9) have been reported by the World Health Organization since the last FluWatch report. Globally to date, the WHO has been informed of a total of 155 laboratory-confirmed human cases with avian influenza A(H7N9) virus, including 48 deaths.

PHAC – Avian influenza A(H7N9)
WHO – Avian Influenza A(H7N9)

Influenza A(H5N1): The first confirmed case of influenza A(H5N1) was reported in Canada on January 8, 2014. The onset of symptoms was Dec 27, 2013 followed by admission to hospital on January 1, 2014. The case died on January 3, 2014. The case travelled to China during December 2013 but did not visit any farms or markets. The source of exposure is unknown at this time. One close contact who travelled with the case has shown no symptoms and other close contacts at home or in the hospital continue to be monitored by public health officials. There have been 649 human cases of A(H5N1) in 16 countries over the last decade, primarily in people who were exposed to infected birds. The risk to Canadians is very low, as there is no evidence of human-to-human transmission.

Human Swine Influenza

Influenza A(H3N2)v: No new cases of human infection with influenza A(H3N2)v were reported in week 01. In 2013, a total of 19 A(H3N2)v cases including one hospitalization were reported.

Centers for Disease Control and Prevention Influenza A(H3N2) Variant Virus

Middle East Respiratory Syndrome Coronavirus (MERS-CoV)

Two new cases of MERS-CoV, and one death and a previous case have been reported by the World Health Organization since the last FluWatch report. Globally, from September 2012 to date, the WHO has been informed of a total of 178 laboratory-confirmed cases of infection with MERS-CoV, including 75 deaths. All cases have either occurred in the Middle East or have had direct links to a primary case infected in the Middle East.

PHAC – Middle East respiratory syndrome coronavirus (MERS-CoV)
WHO – Coronavirus infections

International Influenza Reports

World Health Organization influenza update

World Health Organization FluNet

WHO Influenza at the human-animal interface

Centers for Disease Control and Prevention seasonal influenza report

EuroFlu weekly electronic bulletin

European Centre for Disease Prevention and Control - epidemiological data

South Africa Influenza surveillance report

New Zealand Public Health Surveillance

Australia Influenza Report

Pan-American Health Organization Influenza Situation Report

FluWatch Definitions for the 2013-2014 Season

Abbreviations: Newfoundland/Labrador (NL), Prince Edward Island (PE), New Brunswick (NB), Nova Scotia (NS), Quebec (QC), Ontario (ON), Manitoba (MB), Saskatchewan (SK), Alberta (AB), British Columbia (BC), Yukon (YT), Northwest Territories (NT), Nunavut (NU).

Influenza-like-illness (ILI): Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which is likely due to influenza. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

ILI/Influenza outbreaks

- **Schools:** Greater than 10% absenteeism (or absenteeism that is higher (e.g. >5-10%) than expected level as determined by school or public health authority) which is likely due to ILI. Note: it is recommended that ILI school outbreaks be laboratory confirmed at the beginning of influenza season as it may be the first indication of community transmission in an area.
- **Hospitals and residential institutions:** two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case. Institutional outbreaks should be reported within 24 hours of identification. Residential institutions include but not limited to long-term care facilities (LTCF) and prisons.
- **Workplace:** Greater than 10% absenteeism on any day which is most likely due to ILI.
- **Other settings:** two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case; i.e. closed communities.

Note that reporting of outbreaks of influenza/ILI from different types of facilities differs between jurisdictions.

Influenza/ILI Activity Levels

1 = No activity: no laboratory-confirmed influenza detections in the reporting week, however, sporadically occurring ILI may be reported

2 = Sporadic: sporadically occurring ILI and lab confirmed influenza detection(s) with **no outbreaks** detected within the influenza surveillance region†

3 = Localized: (1) evidence of increased ILI* ;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring in **less than 50% of the influenza surveillance region**†

4 = Widespread: (1) evidence of increased ILI*;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring **in greater than or equal to 50% of the influenza surveillance region**†

Note: ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls.

* More than just sporadic as determined by the provincial/territorial epidemiologist.

† Influenza surveillance regions within the province or territory as defined by the provincial/territorial epidemiologist.

We would like to thank all the Fluwatch surveillance partners who are participating in this year's influenza surveillance program.

This report is available on the Public Health Agency website at the following address: http://www.phac-aspc.gc.ca/fluwatch/index.html.

Ce rapport est disponible dans les deux langues officielles.